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"Defense Aviation for the Coming Century"

Government Keynote Address of
The Under Secretary of Defense for Acquisition and Technology
Dr. Paul G. Kaminski

to the
AIAA/SAE World Aviation Congress
Sheraton Gateway Hotel, Los Angeles, CA

October 23, 1996

Thank you for the kind introduction. It's a great pleasure to be with you this morning. Today, I would like to share some of my views on the Department of Defense's plans for modernizing our aviation forces for the coming century.

Before I do so, I'd like to say a little about the extremely talented and dedicated people we have serving in the nation's armed forces today. I travel around and visit various installations to see our systems in the field and how they are being used. I have benefited greatly from the opportunity to fly in the F-18, B-1, B-2 and the U-2. I'm very impressed with the hardware we have fielded, but invariably I'm even more impressed with the young men and women who operate the hardware. We are blessed as a nation with the quality of people we have in our Armed Forces and we must work hard to keep that quality in the future.

To do so, it is important that we continue to provide them with affordable systems that are second to none on the battlefield—or in the skies above it. The key question is: how will we sustain and modernize the forces we need within the resources likely to be available to us? In the current environment, total DOD resources are not likely to increase.

This morning I would like to give you a broad overview of how we are going about preserving our critical legacy of technological superiority in defense aviation. I will do so by speaking first about how we are adjusting our buying practices to leverage commercial products, processes and technology; second, about our preparations to launch a major new review of defense strategy; and third, about our existing modernization plans for heavy bomber, air mobility and tactical aviation forces.

LEVERAGING COMMERCIAL MARKETS

Let me turn now to our efforts to leverage commercial technologies, processes, and products. Until recently, our defense acquisition system had been shaped and conditioned by the Cold War with the former Soviet Union. We had excellent

intelligence. We "saw" Soviet systems as they first appeared on drawing boards; as they progressed through development; and as their performance capabilities were confirmed during test and evaluation.

We determined what performance characteristics were required in our own systems to overmatch the performance of the Soviet systems. The cost of our systems was what it had to be. Now cost is an issue. Cost as An Independent Variable—CAIV—is driving our interest in commercial technologies, processes, and products. Our interest is not just in the acquisition costs, but in life cycle costs.

This DOD interest in commercial opportunities is driven by the fact that commercial investment in R&D surpassed that of the Defense Department by 1965—and the disparity has been growing ever since. This R&D investment growth pattern has built a large, dynamic economy and established the commercial sector as the driving force behind the pace of technological innovation in the country today.

As a result, we are witnessing breathtaking changes—driven by commercial markets—in the industrial base supporting our weapon systems and new military capabilities. No where is this more evident than in the fields of advanced processing, communications and information management.

From a Department of Defense perspective, we must have continued access to these leading edge technologies and both life cycle cost and cycle time are key issues. We must be able to rapidly insert new technologies into weapons systems at an affordable cost. Our focus is on taking commercial components, subsystems and systems, and adding the system engineering glue to create system-of-systems capabilities. This means we need to be able to buy off commercial production lines and adopt world class commercial buying practices and processes.

We have found, and much of industry has echoed, that our prior application of defense-unique requirements often presented barriers to achieving these goals. Our whole program of acquisition reform is aimed at eliminating those barriers. We are strongly encouraging the use of non-Government standards and performance-based specifications on all new contracts. We are committed to working with industry to establish world class, non-proprietary standards that support open architectures.

Most of our acquisition reforms have impacted new contracts. To get at existing contracts, we have launched a "Single Process Initiative" to consolidate the number of government imposed processes in our supplier's facilities through "block changes" to existing contracts. In nine and half months, over 100 contractors have made over 500 process changes. A little over six months ago, we signed what I call the "mother of all block change modifications" with Raytheon. This single block change affected 16 separate Raytheon facilities and a total of 884 contracts in the areas of soldering

procedures, engineering change approval, acceptance testing, configuration audits, annual test station certification, material review boards, cost data and performance reporting, calibration standardization, and component rescreening.

In addition to reforming our buying practices, the Department is pursuing a dual use strategy. The fiscal year 1997 Defense Appropriations Act contains $185 million to begin the Dual Use Applications Program or DUAP, a joint program conducted by the three military departments and executed for one year by my office, after which it will transfer to the Services.

The DUAP will be a unique opportunity to use new authorities for acquiring dual use technologies and products of joint interest. I think of the DUAP as a means for DOD to leverage commercial capabilities in defense markets. It is something I expect to play an increasing role in influencing the Department's long-term modernization plans. We are placing equal emphasis on leveraging the international capabilities of our allies—acquisition reform breaks down many of these barriers as well.

QUADRENNIAL DEFENSE REVIEW

This brings me to the QDR, or the Quadrennial Defense Review. The QDR will take a fundamental look at the Department's Strategy, Force Structure, Modernization, Infrastructure, and Readiness to meet its future mission requirements. I would expect the QDR report to be complete in the Spring of 1997.

I think we're beginning to see a fundamental new planning trend emerge here with the QDR. In response to the pace of change in threats, warfighting concepts, and technological opportunities, it appears we need to conduct a comprehensive review of defense mission requirements review every four years at the beginning of each administration.

Without trying to second guess the outcome of the 1997 QDR, I think it is worthwhile to share with you some of my views on what we can reasonably expect to do. On the input side, we can expect a more robust set of threat scenarios to be considered—beyond the two MRCs outlined in the Defense Guidance. We need to consider contingency operations and their OPTEMPO demands today, but we also need to think about the future—especially as we consider new programs and technology. It is appropriate to look at the future consequences of present decisions over the next 20 years.

From an investments standpoint, expect tradeoffs to be made in the planned mix of platforms, weapons and C4ISR—Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance. I look at this year's DAWMS—the Deep Attack Weapons Mix Study—as developing the tools and

discipline and serving as a "launching pad" for the 1997 QDR. For the first time, we are beginning to be able to explicitly tradeoff C4ISR—command, control, communications, computers, intelligence, surveillance and reconnaissance—as we conduct platforms and weapons trades.

When the QDR studies are complete, I would not expect to see the Department move away from the two MRC requirement or major across-the-board reductions in force structure. But I do see a major shift coming in our tooth-to-tail ratio and the way we sustain our forces. More cuts in the infrastructure "tail" are clearly necessary. It is my sense that the large support structures we set up over the years to handle finance, accounting, information technology, housing, logistics, maintenance and training are ripe targets for outsourcing savings and quality improvements.

On the programs side, I believe the QDR will affirm the need to time phase our major investments in platforms to make our modernization expenditures sustainable, the need to increase our investment in modernization, and the importance of stability of funding in our modernization program.

As I see it, most of investment in heavy bomber platforms are now behind us—those investments were made in the 1980s and early 1990s with the development and production of the B-1 and B-2 fleets. There are improvements planned for these forces with advanced C4ISR and weapons upgrades. In the 1990s and early 2000s, we are now making major investments in our airlift platforms—first with the C-17, and then the C-130J. And finally, in the 2000s and beyond, it will be time to upgrade our tactical aviation forces with the F-22, F/A-18E/F and the Joint Strike Fighter.

HEAVY BOMBER FORCES

Our planned heavy bomber force structure consists of 95 B-1B's, 21 B-2A's, and 71 B-52H's. Many of you may recall that last year's Heavy Bomber Force Study examined the question of whether additional heavy bombers were needed to meet our national security strategy in the future. At that time, we concluded that the best use of limited defense resources was to invest in a better mix of precision guided munitions and continue modifying our bomber platforms to provide a conventional precision strike capability. Although the force structure decisions are being revisited in the context of trading other dissimilar forces in the DAWMS and QDR, I fully expect that we will continue upgrading the precision strike capability of our existing heavy bomber force.

Last month we certified the B-1B for carriage and release of cluster bomb units. Through our Conventional Munitions Upgrade Program, we are modifying the B-1 fleet to accept the Wind Corrected Munitions Dispenser—a cluster bomb unit container with INS guidance and tail-fin actuators. We also plan to integrate the Joint Direct Attack

Munition (JDAM), the Joint Stand Off Weapon (JSOW) and, the stealthy Joint Air to Surface Standoff Missile (JASSM) to improve the all-weather and standoff attack capabilities of the B-1B. We are also proceeding with electronic countermeasures improvements to improve the self protection and situational awareness capabilities of the B-1 fleet.

We are also improving the conventional precision strike capabilities of the B-2 bomber force. We are in the process of adding a GPS-aided targeting system and GPS-aided munitions—GATS/GAM capability—to our fleet of nuclear capable B-2 bombers. In fact, on October 8, the 509th Bomb Wing successfully conducted the first live GPS-Aided Munition (GAM) drops at the Nellis range complex. Three B-2s dropped a total of 16 live MK-84 (2000-lb) bombs with GAM tail kits from an altitude of over 40,000 ft. The results were breathtaking—thirteen targets were completely destroyed, two had moderate damage, and one had light damage. As we complete the development of the Block 30 full-up-capable aircraft next year and begin retrofitting the Block 10 and 20 airframes, we can probably look forward to additional rounds of block upgrades to the B-2 fleet well into the next century. I see big opportunities for leveraging the B-2 fleet with C4ISR enhancements.

And we are embarking upon sustaining engineering programs to allow the B-52H bomber to continue as a component of our bomber forces through 2040. While the basic design dates back to the 1950's, the platform remains viable because of what technologies we have been able to successfully insert into this platform over the years. As with the B-2, the B-52 will retain the important "swing role" as both a conventional and a nuclear delivery platform.

AIR MOBILITY FORCES

With the end of the cold war and the drawdown of our forward deployed forces in Europe and Asia, time and distance now separate us from the places we need to be—and more often than not, the time is short and the distance is great. In addition to the traditional power projection and force sustainment requirements during a conflict, airlift missions now encompass peacekeeping and humanitarian response to disasters—both natural and man-made.

While the bulk of our heavy forces arrive by sea, history has shown that the forces necessary for rapid crisis response must move by air. To meet currently envisioned requirements, we are: continuing to procure the C-17, our new core airlifter, modernizing our theater assets with the acquisition of the C-130J, upgrading our existing C-141 and C-5 fleet, and enhancing the Civil Reserve Airlift Fleet (CRAF).

With the Department's decision last year to continue production of the C-17 as the nation's core airlifter, we have taken a big step towards maintaining our strategic

airlift capability. On June 1, 1996, we put the program on a stable footing when we signed a seven-year C-17 multiyear procurement (MYP) contract—with a six-year option—worth over $16.2 billion. The dramatic turnaround in the C-17 program and aggressive unit cost reduction made the choice clear. I attribute the program's success to maintaining a focus on working as a government-industry team and applying our acquisition reform principles.

Twenty-eight C-17 production aircraft and one test aircraft have been delivered to the Air Force as of September 1, 1996. In addition to the last sixteen aircraft being delivered, quality has been steadily improving with the latest delivered aircraft having approximately 62% fewer discrepancies than aircraft delivered in the previous year.

The C-17 continues to perform its strategic airlift mission daily. In October 1994, C-17s carried outsize cargo on short-notice deployment to Southwest Asia in support of Operation Vigilant Warrior. In March 1996, C-17s delivered 3 Multiple Launch Rocket Systems to Korea—106.6 tons and 33 passengers—directly from the CONUS. In support of Operation Joint Endeavor in Bosnia, it carried nearly half the airlifted cargo in one-fourth the total airlift missions with a 96% departure reliability.

The Department is maintaining our theater lifter capability with the introduction of latest version of the venerable C-130 Hercules, the "J" model. The C-130J incorporates many improvements over older models, including a "glass" cockpit and head-up displays for the two pilots, new computer systems, and provisions for defensive systems.

The advanced technology propulsion system generates 31 percent more thrust than earlier C-130s, and it is 18 percent more fuel efficient. Performance benefits include 35 percent greater range, 42 percent higher service ceiling, 21 percent increase in maximum speed, and 41 percent decrease in take-off run.

I would expect that the QDR will address other related questions such as: How can we better protect our airlift forces and reduce the vulnerability of Aerial Ports of Debarkation during conflicts? Where should we focus safety improvements? Where can we improve efficiencies in the airlift process? And, how do we maintain and improve access to global airfields?

TACTICAL AVIATION FORCES

I'd like to now turn finally to tactical aviation forces. The tactical aviation modernization plans submitted in the fiscal year 1997 budget request will be reviewed during the DAWMS, the QDR and annually thereafter, and some of the details will undoubtedly change, but the basic plan is sound because it addresses the long-term core needs of the services and accomplishes three basic objectives.

The qualitative advantages enjoyed by our tactical air platforms will continue to be protected through the development of the F-22, F/A-18E/F, and the Joint Strike Fighter. The F-22's low-observable characteristics, supersonic cruise speed, maneuverability, and advanced avionics will ensure the US Air Force maintains air superiority well into the next century. In the coming months, full-scale pole model tests will confirm the aircraft's low-observable signature qualities. The first engineering and manufacturing development aircraft is scheduled to fly in May of 1997 and production deliveries of the first four of a planned total buy of 438 aircraft are scheduled to begin in fiscal year 2001, with initial operational capability slated for fiscal year 2005.

Recent program efforts have continued to focus on streamlining to ensure affordability. Required military specifications and standards for the air vehicle pre-production verification (PPV) contract have been reduced by 85 percent and by 88 percent on the engine PPV contract. Contract data deliverables are expected to be reduced from 262 on the original E&MD air vehicle contract to 20 on the PPV and production contracts. Statement of work directions have been reduced from 147 pages for the original E&MD contract to less than 20 pages for follow on production. Program Office manning is projected to be reduced by over 45% by 2000.

The F/A-18E/F will replace the F/A-18C/D, A-6, and F-14 aircraft as they reach the end of service life and retire. The increased system growth potential—in volume, electrical capability, and cooling capacity—offered by this fighter will help ensure the US Navy continues to meet fighter escort, interdiction, fleet air defense, and close air support requirements well into the next century. The F/A-18 E/F will provide such operational benefits as 80 percent more time on station, 35 percent more range, 52 percent more target coverage, and 80 percent greater standoff for the battle group compared to the combat proven F/A-18 C.

The first E&MD model of the F/A-18 E/F made its initial flight on November 29, 1995. Three flight test aircraft were delivered to Patuxent River Naval Air Station on or ahead of schedule and are fully engaged in the flight test regime. To date, those three aircraft have completed over 100 test flights and flown over 168 hours. Over 84 percent through its engineering and manufacturing development phase, the E/F program is on cost, on schedule and 900 pounds below its weight specification. Initial operational capability is planned for fiscal year 2001, providing a critically needed military capability and a foundation for transition to the Joint Strike Fighter.

Some elements of the Congress made a run this year on knocking the Marine Short Take Off and Vertical Landing—or STOVL—variant of the Joint Strike Fighter out of the program as a cost savings measure. In June, I testified before the Military R&D Subcommittee of the House Committee on National Security that this would have a

significant impact on the JSF program and would not be the best solution to making our overall TACAIR modernization program more affordable.

Aside from the fact that the STOVL strike fighter variant provides Naval expeditionary combined arms forces with extraordinary basing flexibility, STOVL needs to be considered more broadly than thinking about it only as a Marine Corps issue. Terminating STOVL would also eliminate participation of the Royal Navy and other potential international partners, whose primary interest is in the STOVL version.

Although not yet quantified, there may be some room for a STOVL variant in the Air Force or Navy inventory. Going to shorter fields doesn't hurt us for some of the Air Force's Air Expeditionary Force operations in the world of the future, and this may also open up opportunities for alternatives to current carrier size.

A little less than two years ago, about the time we were preparing to send the FY96 budget request to the Congress, it was not at all certain that the Joint Strike Fighter Tri-Service "Family of Aircraft" concept was viable. I think that uncertainty was reflected in the radically different positions taken by the four defense oversight committees on the FY96 authorization and spending acts.

Over the past fifteen months, my sense is that the program has really gelled. I believe the JSF commonality concept is not only viable, but also the most affordable approach to meeting the Services' needs.

What's changed? Simply stated--we've put our requirements act together. We now have all the services using a much more rigorous requirements generation process, thinking joint, and incorporating modeling and simulation to support cost-performance trades. We're treating cost as an independent variable in which every requirement must earn it's way on to the airplane.

As a result, JSF cost commonality is projected to be in the 80-90 percent range. While each of the Services will accept some compromise in performance, it appears as though this will be small with insignificant impact on their operational concepts and no significant impact on their warfighting capability. It is important to realize that the Joint Strike Fighter is <u>not</u> being pursued according to the TFX model tried in the 1960's. We are building three different designs—not a single design. Our cost benefits come from using the same flexible manufacturing line, and from using common subsystems and high cost parts.

US versions of the JSF will be highly leveraged by off-board sensors and C4ISR systems. By piping information into the cockpit from Joint STARS, AWACS, unmanned aerial vehicles like Predator, and overhead satellites, the aircraft can be built to achieve greatly improved situation awareness with a less expensive on-board sensor suite.

I believe the Department has an opportunity to replace the Air Force's F-16s, the Navy's F/A-18s and Marine AV-8Bs with a tri-service family of aircraft ranging in unit flyaway cost from $25 to 35 million—and saving about $16 billion in development costs and more than $60 billion in life cycle costs compared to three separate Service unique programs.

Let me underscore the last point. Our attention is not focused solely on the initial acquisition cost. We are concerned with overall life cycle cost. This emphasis is driven by the fact that 60-70% of most weapon system's costs are incurred subsequent to initial deployment of the system. To the extent the Department maintains systems longer, life cycle cost becomes a more important consideration.

The message here is that "back end" sustainment costs are receiving more "up front" design attention. The JSF program is committed to this approach. There is a sizable technology maturation effort underway on the JSF program. Each technology effort must "buy it's way onto the program" in terms of reducing life cycle cost and program risk.

To support these investment decisions, there is a fairly well developed life cycle cost model that includes estimates for operational and support elements like unit level consumables, training, expendables, depot maintenance and mission personnel.

As I stated earlier I am emphasizing within the Department and on programs like JSF is the need to reduce the logistics "footprint" of our weapon systems. There is a tremendous leveraging effect associated with reducing the amount of support equipment and consumables we must take with us when we go to war. This is especially important in the early stages of a conflict when airlift resources are scarce and before a sealift bridge can be closed.

The JSF program is viable and on track. It deserved and received the full support of the Congress as the defense authorization and appropriation conference committees took up the FY97 budget request. Next month, the Department will down select from three to two competing contractor teams.

I can not discuss all of our major aviation programs today, but I can not end without briefly mentioning that the V-22 with its speed, range and payload has the potential to enormously increase the combat capability of Marine Corps and Special Operations Command maneuver forces. It promises to be a revolutionary new capability and that it will allow our forces to cover large portions of the battle area rapidly.

Shortly after being appointed to my current job in February 1995, I approved continuation of Engineering and Manufacturing Development and the procurement of long-lead items for the first low-rate initial production of the V-22. A Defense Acquisition Board is scheduled in February 1997 to consider approval of the first low rate initial production segment of the program. As the program matures, I expect to consider multi-year procurement alternatives for full rate production.

SUMMARY

In closing, my thoughts on modernizing our aviation forces can be summarized as follows:

- We are pursuing a broad program of acquisition reform and a dual-use investment strategy to better leverage commercial markets for defense applications and our international partners as well;

- We are about to launch a Quadrennial Defense Review to take a comprehensive look at the Department's plans for meeting future mission requirements—I do not expect large adjustments in force structure to emerge from this review, instead I see the need for more cuts in the infrastructure "tail" and more outsourcing of non-core functions;

- The Department is committed to a three pronged approach for modernizing aviation forces—time phased investments, an increase in investment funding, and stability of investment funding;

- Bomber force modernization, largely behind us, will be directed towards upgrading the convention precision strike capabilities of existing platforms through C4ISR and weapons enhancements;

- Air mobility force modernization, with the C-17 multi-year procurement, is now on a stable footing; and

- Tactical aviation forces in general—and the F-22, F/A-18E/F, and JSF in particular—will consume a larger, but affordable share of the Department's modernization budget in the coming years.

There is no single "instant fix" that the DOD can rely on to meet our national security needs. Omar Bradley once said that "Drawing a plan is 10 percent of the job; seeing that plan through is the other 90 percent." So too with aviation force modernization, we need to see our plans through—over the long haul.